## REMARKS

Claims 1-35 are in the case and have been made subject to a requirement to restrict.

Claims 18, and 19 have been amended to more clearly describe applicant's invention.

Claim 6 has been canceled.

Claims 36 and 37 have been added.

No new matter has been added.

### *Election*

Claims 1-35 are in the case. During a telephone interview with the examiner Claims 1-3, 6-19, 34 and 35 were elected as they apply to SEQ ID NO:20 (Group I). The Examiner has withdrawn Claims 1-3, 7-14, and 16 as drawn to a non-elected invention as these claims to not reference SEQ ID NO:20. Applicants hereby affirm this election. Additionally Claims 4, 5, and 20-35 have been withdrawn by the examiner as drawn to SEQ ID NO:'s other than SEQ ID NO:20 Applicants traverse this additional withdrawal of claims. Claim 35 references SEQ ID NO:20 and should be considered in this application according to the rationale of the requirement to restrict. Claim 35 has been re-written in independent form as new Claim 36 for consideration herein.

The election of claims has not altered inventorship.

Applicants reserve the right to file divisional applications on non-elected claims.

### *Priority*

Applicants take notice of the examiner's acknowledgment of the claim of priority to Provisional Application 60/527,083.

### *Information Disclosure Statement*

Applicants take note of the Examiner's acknowledgement of the information disclosure statement.

### *Claim Objections*

Claims 6, 18 and 19 are objected to for the use of 95% identity without further qualification. 95% sequence identity is suggested. Claim 6 has been canceled in favor of new claim 37 which incorporates the Examiner's suggested language, thus overcoming this objection.

### *Claim Rejections – 35 USC § 112*

Claims 6, 15, and 17-19 are rejected under 35 USC § 112, 2d paragraph for indefiniteness. Specifically the examiner finds the recitation of "polypeptides" unclear as it is applied to the enzyme anonyms crtX, crtY, crtI, crtB, and crtZ as the boundaries of what

constitutes an enzyme is unclear. The limitations of Claim 6 are now in new Claim 37. Claim 37 recites specific enzyme names for clarity.

Claims 6, 15 and 17-19 are rejected under 35 USC § 112, 1st paragraph for failing to comply with the written description requirement. The Examiner suggests that the disclosure id deficient in not describing a representative number of species to adequately describe a sequence having 95% sequence identity to SEQ ID NO:20. Applicants traverse.

Claim 6, originally reciting the limitation of 95% sequence identity, has been re-written as new Claim 37 containing the same limitation. Applicants note that the limitation of 95% identity is in reference to a nucleic acid sequence encoding a defined number of enzymes, each with a specific activity that is described in the specification (see pages 10-13 ). The 95% sequence identity is well within the established parameters of codon degeneracy understood by the skilled person. It is well settled that "[W]hat is conventional or well known to one of ordinary skill in the art need not be disclosed in detail. See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d at 1384, 231 USPQ at 94. If a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate description requirement is met. See, e.g., *Vas-Cath*, 935 F.2d at 1563, 19 USPQ2d at 1116; *Martin v. Johnson*, 454 F.2d 746, 751, 172 USPQ 391, 395 (CCPA 1972)" MPEP 2163. Applicants submit that the skilled person would recognize that the inventor was in possession of the invention through the recitation of the structural limitation of the claims (95% identity) in combination with the functional limitations (encoding enzymes of specified function).

Claims 6, 15 and 17-19 are rejected under 35 USC § 112, 1st paragraph for lack of enablement. The examiner finds that the scope of the claims is not commensurate with the disclosure, particularly with respect to the recitation of sequences having 95% sequence identity to SEQ ID NO:20 and encoding all of the recited polypeptides. Applicants traverse.

With respect to lack of enablement, it is axiomatic that the touchstone of enablement is whether undue experimentation would be required by the skilled person to practice the claimed invention. A guide to whether undue experimentation is required is provided by the Wands factors (*In re Wands* 858 F.2d 731 8 USPQ2nd 1400 (Fed. Cir. 1988):

(A) The breadth of the claims;
(B) The nature of the invention;
(C) The state of the prior art;
(D) The level of one of ordinary skill;
(E) The level of predictability in the art;
(F) The amount of direction provided by the inventor;
(G) The existence of working examples; and

(H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

The examiner argues that scope of the claims is not commensurate with the disclosure, particularly with respect to the recitation of sequences having 95% sequence identity to SEQ ID NO:20 and encoding all of the recited polypeptides and that the skilled person would require undue experimentation to derive the sequences of the claimed invention. As noted above what constitutes undue experimentation is a test of the evidence as a whole made by weighing the *Wands* factors.

(A) The breadth of the claims / (B) The nature of the invention: The Claims are not broad. The examiner argues that the claims encompass an extremely large number of nucleic acid molecules. Applicants submit that the number of nucleic acid molecules that encode all the recited polypeptides having 95% identity to SEQ ID NO:20 is very small.

(C) The state of the prior art: The state of the art with respect to making comparisons of amino acid identity and high throughput screening of enzyme activity is well developed.

(D) The level of one of ordinary skill / (E) The level of predictability in the art: The level of one of ordinary skill in the art and the level of predictability in the art with respect to performing enzyme assays, and bioinformatic alignments of sequences is high. It is common place in gene shuffling methods to provide high throughput screens useful for detecting changes in amino acid sequence that give improved function. Gene templates having 95% identity and encoding the same enzyme function are commonly shuffled for improved enzyme activity. The skilled person recognizes that the structural similarity between nucleic acid sequences having 95% identity is sufficiently high so as to reasonably predict that they will encode proteins having the same function.

(F) The amount of direction provided by the inventor/ (G) The existence of working examples / (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure. The direction provided by the inventor is complete and supported by the working examples, detailing how to make and use the invention. As noted above, the experimentation needed by the skilled person will not be undue given the state of the art and the disclosure of the present application.

Claims 17-19 are further rejected under this statute for the inclusion of green plants, which the examiner suggests are difficult to transform with the recited nucleic acids and have a low success rate. Without intending to agree with the examiner's statements the claims have been amended to remove the limitation of green plants as hosts.

In view of the foregoing reconsideration of the claims as amended and withdrawal of all rejections is respectfully requested

Respectfully submitted,

S. NEIL FELTHAM
ATTORNEY FOR APPLICANTS
Registration No.: 36,506
Telephone: (302) 992-6460
Facsimile: (302) 992-5374

Dated: September 06, 2006